ciated with fever, malaise, dizziness, headaches, anemia and even death. WILLIAM ABRAMOVITS, MD


REFERENCES

Neldner KH, Hambridge KM: Zinc therapy of acrodermatitis enteropathica. N Engl J Med 292:879-882, Apr 24, 1975

Kay RG, Tasman-Jones C, Pybus J, et al: A syndrome of acute zinc deficiency during total parenteral alimentation in man. Ann Surg 183:331-340, Apr 1976

Wexler D, Pace W: Acquired zinc deficiency disease of skin. Br J Dermatol 96:669-672, Jun 1977

Mills CF, Quarterman J, Chesters JK, et al: Metabolic role of zinc. Am J Clin Nutr 22:1240-1249, Sep 1969


## Current Antifungal Therapy

CUTANEOUS FUNGAL INFECTIONS are frequently seen in an office based practice. They are mainly treated by topical agents.

Tinea versicolor, caused by Pityrosporum orbiculare (Malassezia furfur), is often treated with 2½ percent selenium sulfide suspension applied for ten minutes a day or overnight initially and less frequently subsequently. Acrisorcin (Akrinol) sodium thiosulfate is also effective.

Superficial mycoses caused most frequently by Trichophyton rubrum, Trichophyton mentagrophytes or Epidermophyton floccosum include tinea pedis, cruris or corporis. Several topical agents may be used successfully. Tolnaftate (Aftate, Tinactin) is a colorless, odorless compound available as a cream, liquid or powder. It has a cure rate of 73 percent to 93 percent and is available over the counter. Haloprogin (Halotex) is available as a 1 percent solution or cream, and applied daily gives 68 percent to 92 percent cure rates. Clotrimazole (Lotrimin) is an imidazole with a wide range of activity against dermatophytes, yeasts, filamentous and dimorphic fungi. Available as a 1 percent solution or cream, it gives a 59 percent to 85 percent cure rate. Miconazole (MicaTin) is also an imidazole and is effective against dermatophytes, yeast and Gram-positive bacteria and gives a 75 percent to 100 percent cure rate. It also has been found effective in the treatment of aspergillosis, coccidioidomycosis and cryptococcal meningitis. Haloprogin, clotrimazole and miconazole are available on prescription only.

Underlying factors which predispose to dermatophyte infection should be corrected. They include excessive perspiration and retention of sweat by tight fitting garments and shoes; obesity, and diabetes mellitus.

Oral administration of griseofulvin should be reserved for patients unresponsive to topical therapy. In its new form, the active ingredient is dispersed as ultramicrosized particles in a polyethylene glycol vehicle (Gris-PEG, Fulvicin-UIF). Since it does not require fat for absorption, it can be taken without meals. The enhanced absorption of the compound usually requires a dose of only 125 mg twice a day. Higher doses may be needed for recalcitrant and refractory infections. WILLIAM V. R. SHELLOW, MD


REFERENCES

Jones HE, Reinhardt JH, Rinaldi MG: A clinical, mycological and immunological survey for dermatophytosis. Arch Dermatol 108:61-65, Jul 1973

VanDersarl JV, Shepherd RH: Clotrimazole vs haloprogin in treatment of tinea cruris. Arch Dermatol 113:1233-1235, Sep 1977

Wallace SM, Shah VP, Epstein WL, et al: Topically applied antifungal agents. Arch Dermatol 113:1539-1542, May 1977

Medoff G, Kobayashi GS: Selecting the appropriate antifungal agent. Drug Ther Bull 8:55-64, Aug 1978


## Future of Antiandrogens in Acne

IT IS WELL RECOGNIZED that the responsiveness of the skin to androgens is associated with many common disorders such as hirsutism, male pattern baldness and acne vulgaris. Although alterations in the keratinization and inflammatory reaction in the follicular duct play a role in the pathogenesis of acne, there is fairly good evidence that lipogenesis in the sebaceous gland is necessary for the disease to occur. The primary events in sebaceous gland lipogenesis appear to be controlled by androgens.

Thus, theoretically it would be reasonable to treat acne with topical agents that are antiandrogen in nature. Cyproterone acetate (CPA) has been used in Europe. Its mechanism of action is competition for the androgen receptor on the sebaceous gland cell. While Cunliffe and Pye have reported no success in its topical use, Winkler has reported decreased sebum secretion of sequential use. CPA with ethynol estradiol given orally results in distinct improvement of acne, but no reports on topical use are available. Flutamide is a similar compound which is nonsteroidal and is effective in animal studies, but has not been tried in humans.

Progesterone competitively blocks the conversion of testosterone to dihydrotestosterone, when applied to male pubic skin reduces 5-reductase activity, but does not reduce sebum output. Estrogen in large nonphysiologic doses reduces seba-

ceous gland size and sebum output, but their mechanism of inhibiting androgen action is unclear. Ethinyl estradiol applied topically reduces sebum production.

There are several controversies and some confusion in the literature regarding the activity of topical antiandrogens. These inconsistencies arise from the fact that different vehicles produce different percutaneous absorption, while some substances initially dissolve the antiandrogen, but later crystalize it, or are absorbed too rapidly. In addition, skin bacteria, proteins, lipids and other agents transform the antiandrogens before they reach their site of action, namely the sebaceous gland cells.

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**REFERENCES**

Nikkari T, Valavarra M: Effects of androgens and prolactin on the rate of production and composition of sebum in hypophysectomized female rats. J Endocrinol 48:373-378, Nov 1970

Cunliffe WJ, Shuster S, Smith AJ: The effect of topical cyproterone acetate on sebum secretion in patients with acne. Br J Dermatol 81:200-201, Mar 1969

Pye RJ, Burton JL, Harris JT: Effects of 1 percent cyproterone acetate on sebum excretion in patients with acne. Br J Dermatol 95:427-430, Mar 1976

Winkler K: Die Antiandrogene in der Dermatologie (Gravimetrische Fettbestimmungen während Cyproteronanwendung). Arch Klin Exp Dermatol 233:296-301, Aug 1968

Lutsky BN, Budak M, Koziol P, et al: The effects of a nonsteroid antiandrogen, flutamide, on sebaceous gland activity. J Invest Dematol 64:412-417, Feb 1975

Pochi PE, Strauss JS: Endocrinologic control of the development and activity of the human sebaceous gland. J Invest Dermatol 62: 191-210, Jan 1974